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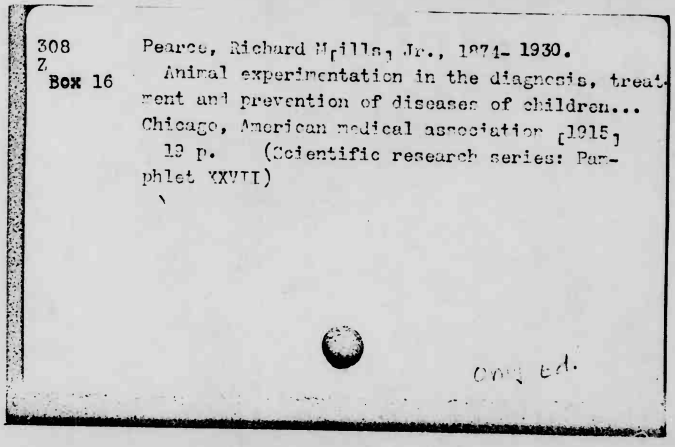
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Animal Experimentation in the Diagnosis, Treatment and Prevention of Diseases of Children

RICHARD M. PEARCE, M.D.
PHILADELPHIA

DEFENSE OF RESEARCH SERIES
PAMPHLET XXVII

Issued by the Bureau on Protection of Medical Research of the Council on Health and Public Instruction of the American Medical Association

"In the health of the people lies the wealth of the nation."
—*Gladstone.*

AMERICAN MEDICAL ASSOCIATION
FIVE HUNDRED AND THIRTY-FIVE NORTH DEARBORN STREET
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1915

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RICHARD M. PEARCE, M.D.
PHILADELPHIA

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Now, if it can be shown that animal experimentation is of value, even if it be only in a single disease, in relieving the suffering of mankind, the claim that

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animal experimentation is futile is rendered worthless, and at the same time the moral and ethical basis of the practice is established.

As your society is one which avows an interest in children as well as animals, and as a large share of its efforts is directed toward shielding children from the ill effects of their environment, I will, in support of the argument that animal experimentation is not futile, present examples of how animal experimentation contributes to the health and happiness of the child; and I may add that the examples I offer are, for the most part, every-day procedures in the diagnosis and treatment of diseases of children — procedures of definitely known value.

In no field of medicine are the results of animal experimentation so easily demonstrable as in that of diseases of children. Children are especially liable to preventable diseases due to bacteria, and on such diseases bacteriology has in the past thirty years thrown a great flood of light, and the knowledge thus gained has not only greatly decreased the mortality of infancy and childhood, but also, as a result, has increased the expectancy of life.

That this general result has been obtained is a matter of popular knowledge, but the details of how it has been obtained and the share animal experimentation has had and is still having, is not always clear to the public. That animals were used in the original studies of the cause as well as the cure of diphtheria is well known, but few persons outside the medical profession know that animals are still necessary in many instances for the exact diagnosis of the disease, often for the determination of the duration of quarantine, and for the production and testing of diphtheria antitoxin. Therefore, with diphtheria, as with other preventable diseases, animal experimentation still acts to protect the individual and the public.

DIAGNOSIS

Tuberculosis.—Take, for example, in the field of diagnosis the case of tuberculosis, to which children are especially liable. This justly dreaded disease may occur as the well known "consumption" of the lung, or more frequently as obscure affections of the bones,

the joints, the lymph-glands or the coverings of the brain. Many of these conditions are difficult of diagnosis in the early stages. A lesion of the spine or of a joint may escape diagnosis until a hump-back child or a chronic hip disease is the result. Many tuberculous lesions simulate so closely other diseases that diagnosis cannot be made by the ordinary methods of inspection and physical examination, and exact knowledge of the condition is therefore delayed until the disease has so far progressed that successful treatment is difficult. Moreover, the direct microscopic examination of fluids or tissue from such diseases is not always of help, because in tuberculosis of the bones and joints, the lymph-glands and the cavities of the body, the tubercle bacilli are present in such small numbers that usually the microscope fails to reveal their presence. If, however, such fluid or tissue is injected into a guinea-pig, the bacilli present, be they ever so few, will cause tuberculosis to develop in the guinea-pig and thus establish a diagnosis. The importance of this test cannot be overestimated; not only does it ensure an exact diagnosis and therefore rational treatment, but time — perhaps the most important element when surgical intervention is demanded — is saved. Every year the fate of thousands of children depends on the use of guinea-pigs for this test.

Hydrophobia.—This disease is more common among children than adults, partly because of their close association with domestic animals, and partly because of their lack of judgment in the recognition of abnormal conditions in an animal. When a child, or an adult for that matter, is bitten, the question arises: Is the dog rabid or is he merely vicious or ill-tempered? If the physician in charge of the case realizes his responsibilities, the animal is found and killed — for whether rabid or vicious he is a menace to the community — and thus the sacrifice of the animal is recognized as a justifiable procedure, tending to protect the welfare of the public. But the symptoms of hydrophobia do not develop at once and the physician wants to know whether the child is to be treated for hydrophobia or merely by the usual antiseptic measures applicable to a wound of the skin. A tentative opinion may be reached if on microscopic examination of the brain of the dog are found the peculiar little bodies usually

associated with rabies and known as "Negri bodies." Experience has shown, however, that the surest test is the inoculation of rabbits with some tissue from the dog's brain. The development in such animals of the symptoms of rabies settles the question conclusively and thus the nature and extent of treatment of the human case under observation.

Syphilis.—The common form of this disease in children, the inherited or congenital form, is not always readily recognized. The disease may take many obscure phases and exact diagnosis, and therefore specific treatment, is impossible unless a certain specific test is made. This test (the Wassermann test), too technical to present in detail, requires every time it is made some fresh blood of the sheep as well as some serum of the guinea-pig. In all laboratories, usually those of hospitals, in which this test is performed, animals are kept for this purpose. In the case of the guinea-pig the animal is usually killed at the time of bleeding, but as only a small amount of sheep's blood is needed, these latter animals are kept for some time and are the subjects from time to time of repeated bleedings. Although the procedure is quite different from the inoculation experiments previously described, it is nevertheless a form of animal experimentation, and one without which the diagnosis of syphilis frequently could not be made. But this test has another value. It is a guide to treatment. As long as the disease is not cured the positive test persists. It is possible by repeating this test to determine by its permanent disappearance, the time when the child (or adult) is cured. This information can be obtained in no other way. What is true of the congenital disease is true also of the acquired, which, however, is relatively rare in children. The Wassermann reaction is therefore not only a diagnostic measure, but of value in prophylaxis as well, for its disappearance points to cure and therefore the impossibility of spreading infection. To obtain this valuable information, the use of animals to the extent of bleeding sheep and guinea-pigs is essential.

Diphtheria.—When a child has diphtheria the diagnosis may frequently be made as a result of the inspection of the throat (or nose). If this is impossible in most doubtful cases a bacteriologic study of cultures

from the throat clears up the diagnosis. In a small number of cases, most frequently diphtheria of the nasal passages, both these methods of diagnosis fail, usually because the appearance of the disease is not characteristic and the bacteria found differ from the true form of diphtheria bacillus. Under such circumstances, it is most important, for two reasons, to establish a diagnosis: (1) in order that, if the condition is diphtheria, the child may have the specific treatment — diphtheria antitoxin — and (2) that other children may be protected against an unrecognized case of diphtheria. Under such circumstances animal experimentation is the only resource. A guinea-pig is inoculated with bacteria from the throat or nose of the sick child and the diagnosis depends on whether or not the guinea-pig develops the characteristic symptoms and lesions of experimental diphtheria. But for still another important purpose is this test used in diphtheria. A regulation of the department of health requires that a child with diphtheria shall not be released from quarantine until bacteriologic examination shows the throat, or other part affected, to be free of diphtheria bacilli. The object of this, naturally, is to prevent the spread of the disease. Usually the bacilli disappear from the throat within a reasonable length of time, corresponding practically to complete convalescence and restoration to a condition allowing the child to take up its usual activities. Sometimes, however, the bacilli persist for an unusual period. The child is perfectly well and eager to go to school; the parents find the restrictions of quarantine irksome and rebel at the health regulations. But the child is still a source of infection; the community must be protected. There comes a time, if the bacilli persist for weeks or months, when the situation resolves itself into the practical question: "Are the persisting bacilli virulent and capable of causing disease?" To settle this point, an inoculation of guinea-pigs, as described above, is made. If the bacilli have no effect on the animals, quarantine, with certain precautions, is raised; if, however, the bacilli cause diphtheria in the experimental animals, the quarantine is maintained. The latter use of this animal test is not strictly speaking a diagnostic test, but it is one of the most important procedures in lessening the spread of diphtheria among children.

These examples of the use of animals in the diagnosis of diseases of children have been presented in some detail in order to bring out clearly the fact that these and many similar tests are as much a part of the armamentarium of the physician and surgeon as are the stethoscope and the clinical thermometer, or the scalpel and the Roentgen ray. More than that, they belong to the group of so-called specific tests, that is, a positive result indicates the exact nature of the disease. A guinea-pig developing tuberculosis after the injection of fluid from a diseased joint, means that the joint is tuberculous; a guinea-pig developing experimental diphtheria after receiving cultures from the throat of a child means that virulent diphtheria bacilli exist in the child's throat, and so on through the list of these specific tests. There can be no doubt, no question of interpretation. And it may be added that all these procedures are common, every-day procedures in diagnosis.

This list might be lengthened to include less frequent animal tests, as that for anthrax (a disease contracted from infected hides of cattle), glanders (contracted by contact with infected horses) and other diseases to which children as well as adults are susceptible. Also might be added the frequent use of animals, especially the guinea-pig, in the study of infected wounds, especially those from rusty nails, in connection with which it is of great importance to know whether the bacillus of lockjaw is present; but the examples given are sufficient to indicate the constant use of these valuable methods, without which diagnosis would not be the exact procedure which is the basis of modern scientific medicine.

TREATMENT

The most overwhelming proof of the value of a specific treatment is seen in connection with antitoxin in diphtheria. Before the introduction and use of antitoxin in 1895, diphtheria could truthfully be called one of the greatest scourges of childhood. With the increasing employment of antitoxin, however, the death-rate began to fall all over the civilized world.

The accompanying table (Table 1), quoted from Keen, gives the official reports of the mortality from diphtheria for every 100,000 inhabitants in certain

American and European cities before the use of antitoxin and after its employment had become general:

TABLE 1.—MORTALITY FROM DIPHTHERIA PER 100,000 INHABITANTS

	1894	1905
New York (Manhattan)	158	38
Philadelphia	128	32
Baltimore	50	20
Boston	180	22
Brooklyn	173	43
Pittsburgh	64	26
London	66	12.2
Paris	40	6
Vienna	114	19

Dr. W. H. Park, of the New York City Board of Health, in a study of the average death-rate from diphtheria in nineteen large cities of the world in 1893 shows it to have been slightly over 80 per 100,000; in 1895, when the antitoxin treatment was introduced, it began to fall, and by 1907, when antitoxin was generally employed, the rate had dropped to 17 per 100,000.

In the London hospitals the mortality was reduced from 29 per cent. to 10 per cent. The same is true of other large hospitals of the world.

Table 2 shows the value of early treatment, as observed in the Hospital for Contagious Diseases in New York City:

TABLE 2.—DEATH RATE ACCORDING TO DAY OF INJECTION

	Death Rate
218 cases treated on first day	.....
1,153 cases treated on second day	4.59
880 cases treated on third day	12.50
598 cases treated on fourth day	16.40
351 cases treated on fifth day	14.24
694 cases treated after fifth day	14.15
Total, 3,894 cases	10.57

Not only has the death-rate been much lowered, but the severity of the disease and its complications have been marvelously changed for the better. Perhaps this is best seen in the great diminution of the fatal and agonizing croup cases, where the false membrane descends into the windpipe and causes death by slow suffocation. At the Willard Parker Hospital, even the

late and neglected cases of croup that have not had the remedy before admission, now after a large, though belated, dose of antitoxin very rarely die from strangulation. If they succumb to other complications, they are at least mercifully spared the torture of prolonged suffocation. In this hospital, before antitoxin days, two-thirds of the croup patients that required a tube in the windpipe so as to prevent death from suffocation, died; now three-quarters are saved. It is hard to realize what such figures actually mean. In the years preceding the discovery of the germ that causes diphtheria and the working out of its antidote, among the cases reported of patients dying from diphtheria, more than 75 per cent. were attributed to diphtheria of the windpipe. Now, the antitoxin, when early and properly given, will not only cure in the great majority of cases, but those closely exposed to infection, as nurses and relatives of the sick, may be rendered immune by a single small dose of antitoxin. Over 35,000 cases were thus treated by the New York Board of Health without any serious sequel.

Cerebro-Spinal Meningitis.—One of the most fatal and distressing diseases, confined largely to children, is epidemic cerebrospinal meningitis. Before the working out of the antimeningitis serum by careful, scientific experimentation on animals, there was no method of preventing the growth and appalling effects of the micro-organisms that caused the disease. Now we have a serum that not only directly destroys or inhibits the growth of these germs, but also indirectly acts by stimulating the white blood-cells to overcome them, and at the same time a neutralizing action is exerted on the soluble and diffusible poisons that are produced. As a result, not only has the mortality been greatly lowered, but the severe symptoms and crippling complications have been most favorably influenced. The lowest mortality before the serum treatment ran from about 50 per cent. in sporadic cases to 75 per cent. in the epidemic form in different parts of the world. When the serum is now given by spinal (lumbar) puncture, the mortality drops to about 25 per cent. or even lower. If the serum is given early in the disease, the altered mortality is still more remarkable. The accompanying table (Table 3), quoted by Dunn from the studies of Dopter, shows this feature:

TABLE 3.—MORTALITY IN EPIDEMIC MENINGITIS UNDER SERUM TREATMENT

Cases Analyzed According to Period of Injection	Flexner	Netter	Dopter
Period of Injection	Per Cent.	Per Cent.	Per Cent.
First to third day.....	14.9	7.14	8.2
Fourth to seventh day..	22.0	11.1	14.4
Later than seventh day..	36.4	23.5	24.1

In accord with these is the experience of one hospital, the Children's Hospital of Boston, in which for many years a special study of meningitis had been made. During eight years Dr. Thomas Morgan Rotch had treated meningitis in various ways with a mortality varying from 60 to 80 per cent.; but the first year (Nov. 1, 1907, to Nov. 1, 1908) after he began the use of the Flexner serum he treated seventy-four patients, with a mortality of only 19 per cent..

In patients who recover the serum treatment not only shortens the duration of the disease — sometimes by several weeks — but lessens the chances of the terribly destructive sequels, such as hydrocephalus, blindness and deafness. On this point Dr. Dunn of the Children's Hospital of Boston, says:

> The contrast in the appearance of the wards at the Children's Hospital in Boston now, and as compared with the preserum period, is a subject of general remark. Formerly there were almost always to be seen wasted little patients lying with head drawn back, neck rigid, limbs twisted and paralyzed, head swollen by hydrocephalus and other painful conditions, and remaining thus for weeks or months until death resulted. Now the little meningitis patients are soon laughing, talking and playing with other children, and need not to be kept long in the hospital.

Now through what means have these two great life-saving methods been gained? Solely through animal experimentation; at first, in the investigative stage, through the use of rabbits, guinea-pigs, horses and other animals, and at present the horse is still in daily use for the manufacture of these antitoxins, and the guinea-pig, especially in the cases of diphtheria antitoxin, is used for testing its potency. Animal experimentation is therefore as important a part of modern medicine as is the making and testing of drugs of vegetable or mineral origin, and this fact should not be overlooked by those who oppose animal experimentation as a means of research or investigation. It is the everyday means of procuring specific remedies

for the cure of diphtheria and epidemic meningitis, formerly two of the great scourges of childhood.

PROPYLAXIS OR PREVENTION OF DISEASE

Under this head, three procedures of great value, involving animal experimentation, may be discussed. These are the preventive treatment of hydrophobia and lockjaw and vaccination against small-pox. The first two are preventive in the sense that after the person is bitten or wounded, treatment is begun to prevent the development of symptoms; in the last the procedure is for the purpose of preventing infection.

Hydrophobia.—The Pasteur treatment consists in inoculating a bitten person at regular intervals for about twenty days with the altered virus of rabies — at first a very weak virus is used and later stronger virus until the person is immunized. As the immunization takes place it counteracts the virus formed at the site of the bite and the development of the disease is prevented. As the virus of rabies is localized to a large extent in the central nervous system, the material used in this treatment is an emulsion of the spinal cord. To prepare this so that it may be safely used, rabbits are inoculated with what is known as the "fixed" virus of rabies, and from the cords of such animals the weakened virus for treatment is prepared. It is essential, therefore, that if hydrophobia is to be properly treated, rabbits must be used.

Before the Pasteur treatment was introduced, the mortality among persons bitten by animals varied from 6 to 14 per cent. Since then the figures of the Pasteur Institute (from 1886 to 1907) show an annual mortality for twenty-one years of less than 1 per cent. Professor Law of the Cornell Veterinary School presents the accompanying table (Table 4):

TABLE 4.—RESULTS OF TREATMENT IN PERSONS BITTEN BY ANIMALS SUSPECTED AND PROVED RABID, RESPECTIVELY

	Number	Died	Per Cent.
Bitten by animals proved rabid by inoculation.....	2,872	20	0.69
Bitten by animals pronounced rabid by veterinarian.....	12,547	61	0.48
Bitten by animals suspected of rabies	4,747	15	0.31
Average mortality			0.46

In this connection it should be remembered that there is no known cure for rabies when symptoms have once appeared and that death follows a period of suffering, agonizing to the patient and harrowing to the observers.

Lockjaw.—This disease, known also as tetanus, and due to the bacillus of that name, is a disease with a definite incubation period and may for that reason be cured if treatment is begun immediately after the person is wounded. The serum which is used for this purpose is therefore usually described as a preventive rather than a curative serum, but sometimes fully developed cases, if mild or chronic, may be cured. This preventive treatment is particularly of value in the so-called "Fourth of July" injuries and has been largely responsible for the reduction of the mortality from tetanus formerly following our great national celebration.

The tetanus antitoxin is prepared in the commercial laboratories of our great drug firms by injecting horses with tetanus toxins, in the same way as diphtheria antitoxin is made. Also guinea-pigs are used to test its potency and purity.

Small-Pox.—Small-pox is essentially a disease of childhood, indeed at one time it was known as "child-pox." That it is peculiarly fatal to children is shown by the fact that in the great Montreal epidemic. with 3,164 deaths, 85 per cent. of these occurred in children under 10 years of age. As to the protection exerted by vaccination, Rotch has shown as the result of a study of small-pox in children in the city of Boston during a period of fifteen years, that no death occurred among vaccinated children under 5 years of age, while at the same time the mortality in the unvaccinated was 75 per cent. From the point of view of animal experimentation it is only necessary to add that this protection of children is gained by using the calf for the production of the vaccine and the guinea-pig for testing its purity. This last, it may be added, is of the greatest importance, for it is through such testing that a pure product is obtained and accidental infection with lockjaw and other diseases prevented.

Thus far have been described only those diagnostic, therapeutic and prophylactic measures, in the every-

day execution of which animals are and must be used. Many other procedures based on animal experiment are in use, but in these, animals were necessary only in the investigative stage; in their practical application the animal is no longer necessary. These, however, could not have been elaborated without the use of animals, and they stand as well-tried procedures, among the most important procedures of modern medicine. Two of these, the tuberculin and luetin tests, must be mentioned.

The *tuberculin reaction* depends on the principle that if a fluid in which tubercle bacilli have grown, and which therefore contains the chemical products of their growth, is injected into an animal or person suffering from tuberculosis, a transient increase of temperature occurs and constitutes the chief sign of a positive reaction; if no tuberculosis exists, no reaction occurs. The method is therefore of great value as a diagnostic test in obscure or doubtful cases of tuberculosis, and also is the generally recognized procedure in determining the presence of tuberculosis in cattle.

The fluid injected is called tuberculin, and as it is sterilized it contains no living bacteria and cannot cause tuberculosis. When the test was first used the tuberculin was injected beneath the skin with the aid of a hypodermic syringe, and the chief reaction which this method gives, is, as I have stated, an increase in temperature. Later it was found that if the diluted tuberculin was placed on the surface of the eye, there followed in tuberculous persons a reddening or congestion of the eye, which might go on to the stage of mild conjunctivitis ("pink eye"). This is known as the Calmette reaction. Still later it was discovered that if the skin was scraped, as in vaccination against small-pox, and the tuberculin applied over such an area, a local reddening — the von Pirquet reaction — could be obtained. There has never been any doubt about the value of the tuberculin reaction. It is one of the most valuable adjuvants in the diagnosis of doubtful tuberculosis.

The test has been much misrepresented by antivivisectionists, but without it, in very many children, tuberculosis would escape detection and proper treatment therefore be impossible.

Luetin is prepared from the micro-organism — Spirochaeta pallida — which causes syphilis. A suspension of this organism is so treated as to cause disintegration of the parasite. The material is then heated so as to ensure the death of all living material in the fluid. Phenol (carbolic acid) is added to prevent contamination, and the fluid — a sterile mixture — is injected into the skin, much in the manner employed in the tuberculin test. It is entirely devoid of living micro-organisms, as was shown by Noguchi, first on rabbits and monkeys, and later by applying it to his own skin and the skin of several physicians who volunteered for that purpose. The reaction in the syphilitic is a slight erythema (or reddening) which may become papular, or occasionally pustular; in the non-syphilitic, *no reaction occurs* and the procedure in such patients has no more effect than the injection of distilled water would have. This test has added greatly to the ease of recognizing obscure cases of syphilis.

Other tests might be mentioned, but these two must suffice to illustrate the typical diagnostic tests gained through animal experimentation, though in their application animals are no longer necessary.

Surgery.—But it is not in medicine alone that animal experimentation has been of value to children. Aseptic and antiseptic surgery are based on the solid rock of animal experimentation, and children have had their full share in the inestimable benefits that have followed modern surgical methods. Septicemia and pyemia are prevented and frequently cured. Cavities of the body formerly out of reach of surgical aid, are now fearlessly explored and life thus saved. As an example, the various obstructions of the bowel peculiar to children are cured in a large proportion of cases. In former times death usually ensued in such conditions, as both physician and surgeon feared the large mortality that followed the opening of the abdomen. Even very young infants are now successfully operated on for this grave condition.

Recently, bone grafting that promises brilliant results in straightening crooked backs and other bony deformities in children has been successfully tried as a result of previous experiments on animals.

Profuse and uncontrollable hemorrhages in the newborn, formerly fatal, are now saved by transfusion, which was first studied and the technic perfected by vessel-suturing in the lower animals. Practically the whole realm of surgical accidents and diseases in children has been benefited and illuminated, directly or indirectly, as a result of animal experimentation.

There is no foretelling to what extent disease can be overcome by persisting in the present fruitful methods. Already infantile paralysis is being hopefully studied as to cause and consequent cure. The same can be said of other crippling and fatal diseases.

Cretinism. — Even certain forms of idiocy have yielded to animal experiment. The scant relief possible for most forms of idiocy is well known to both physicians and laymen. In recent years one kind of mental defect has been explained and largely cured by a knowledge of the internal secretion of the thyroid gland. Formerly these individuals were doomed to remain semi-imbeciles. They were repulsive in appearance, with stunted growth, facial blankness, tongue protruding from half-open mouth, trunk large, with pendulous abdomen and short, stumpy limbs. A dull, apathetic mentality was always in evidence. An implantation of the thyroid in the abdominal cavity of dogs by Schiff showed that this gland would functionate even after its removal from its normal location. From this it was but a step to demonstrate that by administering an extract of the thyroid gland by the mouth the symptoms due to its abnormal absence in the child would be removed. The arrested, perverted growth and mental dullness, due directly to the absence of this important internal secretion, can thus be easily corrected by giving the dry extract from the thyroid of an animal. A whole class of hopeless defectives has thus been rehabilitated.

ANIMAL EXPERIMENTATION ENTITLED TO APPROVAL

These examples are sufficient, I think, to demonstrate to you that animal experimentation in your own field, that of child welfare, is not useless, and that medical practitioners and medical scientists are morally bound to continue their work in the hope of adding to our knowledge of other diseases, now little understood.

In this connection it is interesting to note that the foremost medical and scientific bodies of the world have passed resolutions supporting the practice of animal experimentation as a humane effort.

These societies are:

1892: The British Medical Association, representing the medical profession of the British Empire;

1908: The American Medical Association, representing the organized medical profession of the United States;

1908: The American Association for the Advancement of Science, representing all fields of science in the United States;

1913: The Federation of American Societies for Experimental Biology, representing the teachers in the biologic sciences in this country;

1913: The International Medical Congress, representing the medical profession of all nations.

It is worthy of note that against this opinion of the scientists and the organized medical profession of the entire world there is not a single record of a scientific body expressing the opposite opinion.

CRUELTY

No charge of cruelty in medical laboratories or research institutions has ever been sustained in a court of law, and in every instance in which charges have resulted in a libel suit the suit has gone against the antivivisectionists.

In this connection, with this question of the investigation of charges of cruelty, it is well to remember that in the report of the British Royal Commission on Vivisection, issued in 1912, the following statement may be found:

> We desire to state that the harrowing descriptions of operations inflicted on animals, which are freely circulated by post, advertisement or otherwise, are in many cases calculated to mislead the public, so far as they suggest that the animals in question were not under an anesthetic. To represent that animals subject to experiments in this country are wantonly tortured would, in our opinion, be absolutely false.

The claim that anesthetics are not used is indeed as false as it is absurd, for it would be impossible in

the physiologic experiments usually cited in this connection to use with a struggling animal the delicate apparatus which such studies demand—apparatus so responsive that it registers the slightest change in position or movement. The same misrepresentation exists in connection with the oft-quoted reference to the use of curare.

I have worked in laboratories in Massachusetts, New York and Pennsylvania, and have visited most of the important laboratories of this country. With the exception of injection experiments, as used in investigations in bacteriology and immunity, and in feeding experiments, as in the study of nutrition, I have never myself made, nor have I seen, an experiment in which anesthesia was not used, and by anesthesia I mean complete anesthesia with ether or chloroform. As to curare, I have never seen it used, except in a single type of experiment, and that on frogs. I have never seen it used on warm-blooded animals, and have only once heard of it being so used, and in that instance ether was previously administered. Whatever may have been the practice with curare in European laboratories in the early days of physiology, I can truthfully say that in this day and country its use is practically limited to an occasional experiment on the frog.

Likewise the stories of insufficient food, improper quarters and neglect after treatment in recovery experiments are without adequate basis. Direct light, fresh air and proper food every investigator considers essential to the success of his experiment. It is to his advantage to keep his animals in the best possible condition. I have myself discharged, on the instant I discovered his offense, a laboratory attendant who neglected to feed, on one day only, the animals under his care, and in my experience all laboratory heads are especially zealous in their watch over the animals for which they are responsible.

A very significant thing in connection with these charges of cruelty is the fact that it is almost impossible to persuade the persons who make the charges to come to our laboratories and see the actual conditions. Since I came to Philadelphia in 1910 I have been particularly impressed with the false impression given the public through the exhibit and literature of our local

anvivisection society, and, therefore, personally and through the dean of our school, I invited the officers and members of the society to visit our laboratories. I believed that they were honestly laboring under a misapprehension as to facts and would gladly avail themselves of the opportunity of viewing our methods of experimentation. No one, however, during a period of three years responded to the invitation. Finally, last spring, when I repeated my invitation in a public lecture, two members of the local society came to my laboratory, were immediately admitted, saw an operation in progress at the time, inspected all our apparatus and visited the kennels in which were many animals, representing a great variety of experiments.

This experience I present in order to demonstrate to you that the so-called "closed door" of our so-called "halls of torture" is a myth. As far as my laboratory is concerned, the "closed door" does not exist, and I would like to take this occasion to invite any member of this association who is interested to visit my laboratories, with or without previous appointment, as he or she prefers.

I am willing to let our case rest with this brief presentation, but in the few minutes which remain I want to make a plea for both animals and children. Your society, as I understand its purpose, has two objects: the prevention of cruelty to children and the prevention of cruelty to animals. From your program I judge that you divide your activities equally between these objects, and that you judge each of equal value. Your efforts are directed almost solely against the human agent; that is, you protect the child or the animal from man's indifference, thoughtlessness or carelessness and from improper exploitation in commerce and industry. With the sufferings of the child, due to disease, you do not especially concern yourself; this you doubtless regard as a matter for hospitals, dispensaries and other medical social service agencies. Those of you who have much to do with investigating the conditions of children cannot, however, have escaped being impressed with the influence of disease in causing poverty, and is it not poverty that your agents in the vast majority of cases find to be the factor responsible for child neglect? Have not, therefore, the humane societies and the medical profession a com-

mon interest in this matter? Should not both support those individuals who endeavor, even though sometimes it be at the price of the sacrifice of animal life, to diminish disease and the poverty due to disease, and thus create a more favorable and happier environment for children?

The same plea may be made for the smaller domestic animals, the cat and the dog. The suffering of animals due to man's indifference or neglect is infinitesimal compared with that caused by their natural diseases; but no humane society, as far as I am aware, has attempted the study of the diseases of these animals. Money in considerable amounts is furnished by the federal government and by a considerable number of our states for the study of the diseases of animals of commercial value, or of importance to the industries. Our veterinary schools likewise engage in this work, but all these agencies have in mind the economic side, not the humane. One would expect the veterinary schools to study, for example, the diseases of the dog and cat, but in this country, unlike Germany, they have not, and they hasten to inform the public that they do not study experimentally the diseases of these animals, because if they did they would lose—so antagonistic has been the attitude of the antivivisectionists—support for their animal clinics. I am fully aware of the fact that a few humane societies have hospitals and dispensaries for the treatment of diseased and injured animals, but, so far as I am familiar with the situation in Philadelphia and New York, only a small number of animals are treated, few are treated free, and in no instance is a scientific effort made to reach a better understanding of the cause, course and cure of their diseases. I have tried to interest three of the local societies of Philadelphia in this matter, but have received no encouragement. Societies whose funds are largely expended in the wholesale destruction of stray and diseased animals cannot or will not see the advantage to be gained by cooperating with expert medical scientists in the study and treatment of animal diseases. One would think that the discovery of a means of preventing, combating or curing an animal disease would be the greatest triumph for which a humane society could labor. The only reason this ideal is not held is, apparently, the attitude of a few

individuals who oppose all experiments on animals, even though the experiments may be for the benefit of the animals themselves. Such an attitude cannot consistently or conscientiously be adopted by a national body whose efforts are truly humane, and I sincerely hope that the time will come when humane societies will be as much interested in preventing the sufferings of animals caused by disease as they are in preventing those for which man is responsible.

Your common interest in the child and the animal demands that you should *support* and *be supported* by the medical profession, and to this end there should be the closest cooperation in behalf of both child and animal; but if you will not cooperate with us in behalf of the animal, do not, by all that the present-day spirit of social service holds as progressive, altruistic and humane, obstruct *our* work in behalf of the child.

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[Price, 6 cents]

"Every advertisement of a 'cancer cure' cloaks a swindle." If the public could once realize the truth of this, the quacks who engage in this line of charlatanry would find their occupation gone. During the past few years, the United States postal authorities have done a great public service by investigating a number of concerns exploiting so-called cures for cancer. In every instance these "cures" have been found worthless and in nearly every instance the companies have been declared fraudulent and the use of the United States mails denied them.

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Drs. Mixer
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